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REMARKS/ARGUMENTS

The present application includes pending claims 33, 34, 66 and 67. The remaining claims have been cancelled without prejudice so as to better place this application in condition for allowance and/or to focus the issues for appeal.

Initially, the Applicants note that a goal of patent examination is to provide a prompt and complete examination of a patent application.

It is essential that patent applicants obtain a prompt yet complete examination of their applications. Under the principles of compact prosecution, each claim should be reviewed for compliance with every statutory requirement for patentability in the initial review of the application, even if one or more claims are found to be deficient with respect to some statutory requirement. Thus, Office personnel should state all reasons and bases for rejecting claims in the first Office action. Deficiencies should be explained clearly, particularly when they serve as a basis for a rejection. Whenever practicable, Office personnel should indicate how rejections may be overcome and how problems may be resolved. A failure to follow this approach can lead to unnecessary delays in the prosecution of the application.

Manual of Patent Examining Procedure (MPEP) § 2106(II) (emphasis added). As such, the Applicants assume, based on the goals of patent examination noted above, that the current claim objections and rejections now reflect "all reasons and bases" for rejecting the claims, despite the fact that these objections and rejections are different than those delineated in previous office actions.

In general, however, the Applicants are surprised at the new objections and rejections only now being set forth. The Office Action is the fifth substantive office action received from the Examiner since the pending claims were added to the

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application. Only in this fifth Office Action has the Examiner raised these various issues regarding the rejections and objections discussed below. Clearly, this runs afoul of the "principles of compact prosecution," as noted above, and poses various inconveniences to the Applicants, both in terms application pendency, and costs related to prosecution.

I. The Objection To The Drawings Should Be Withdrawn

The drawings are objected to under 37 CFR 1.83(a) because, according to the Office Action, the "initiator" is not shown in the drawings. (See Office Action at ¶ 2). The Applicants respectfully submit, however, that "initiator" is clearly shown in the drawings and is discussed at length in the specification. For example, the specification of the present application states the following:

An initiator 304 [shown, e.g., in Figure 3] within the pyrotechnic device 202 preferably includes an electronic assembly 308 and a pyrotechnic assembly 310.

See application at page 7, lines 16-17. As such, the "initiator" is clearly shown in Figure 3, for example, and discussed at length in the specification.

In paragraph 3, the Office Action also objects to the drawings under 37 CFR 1.83(a). According to the Office Action, the drawings

fail to show the components of each pyrotechnic device as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d).

The application claims have always recited "pyrotechnic devices" and the Examiner is raising this objection for the first time nearly four years after the application was filed. In

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any event, the Applicants respectfully submit, that the claimed "pyrotechnic devices" are clearly shown in the drawings and are discussed at length in the specification. For example, Figure 2 illustrates a networked electronic ordnance system 200, which includes a plurality of pyrotechnic devices 202 interconnected by a cable network 204. An example of the structure of the pyrotechnic devices is provided in Figure 3 and is described in detail in the specification beginning at page 7, line 9. Hence, it is respectfully submitted that the claimed initiator and pyrotechnic devices are shown in the drawings in compliance with the specification of the present application, which states the following:

An initiator 304 [shown, e.g., in Figure 3] within the pyrotechnic device 202 preferably includes an electronic assembly 308 and a pyrotechnic assembly 310.

See application at page 7, lines 16-17. As such, the "initiator" is clearly shown in Figure 3, for example, and discussed at length in the specification.

In view of the above, the Applicants respectfully submit that the initiator and the components of the each pyrotechnic device are shown and described in the specification, and request reconsideration of the objections to the drawings.

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II. The Claim Rejections Should Be Withdrawn

Claims 33, 34, 66 and 67 stand rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent Nos. 6,584,907 ("Boucher") and United States Patent No. 6,283,227 ("Lerche").¹ These rejections are respectfully traversed.

Claims 33 and 34 require, *inter alia*, "means for transmitting a digital arming command onto the network." Claims 33 and 34 further require that "the logic device in each of the pyrotechnic devices is operative for storing activation energy in the associated pyrotechnic device if the digital arming command includes the unique identifier of the logic device." Claims 33 and 34 further recite "means for altering an analog condition of the network to a firing condition . . . and [a logic device] . . . releasing the stored activation energy into the initiator of its associated pyrotechnic device if both (1) the analog condition of the network has been modified to the firing condition and (2) the digital firing command includes the unique identifier of the logic device." Thus, in the claimed device a given pyrotechnic device or combination of pyrotechnic devices can be armed by digital arming signals. The digital arming command causes activation energy to be stored in the particular pyrotechnic devices whose unique identifiers are included in the digital arming command. This allows selected ones of the pyrotechnic devices to be armed and placed in a condition for firing. However, before any of these devices can be fired/discharged, it is also necessary to both (1) modify an analog network condition and (2) issue a firing command that includes the unique identifier for the logic device of that specific

¹ Applicants note with appreciation the Examiner's withdrawal of the rejection of these claims over U.S. Patent Nos. 6,166,452 ("Adams") and 5,825,098 ("Darby").

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pyrotechnic device. As is discussed in the specification, this claimed feature enhances safety by reducing the possibility of erroneously firing a pyrotechnic device. (See, e.g., page 18, line 16 to page 19, line 11). This claimed combination is not disclosed nor suggested in the cited references.

Like the present invention, Boucher apparently recognizes the need to reduce the likelihood that pyrotechnic devices are mistakenly fired. However, Boucher takes a different approach to addressing this issue. In particular, Boucher describes "the use of [a] multi-voltage level communication system in which communication signals are carried at a first voltage and arming signals are provided at a second, higher voltage." (Col. 5, line 66 to col. 6, line 2). Hence, Boucher requires the presence of a higher voltage to charge/arm the pyrotechnic devices. According to Boucher,

Another feature of the present invention is that firing control system 12 and initiators 16, 18, etc., may be configured so that different types of signals are conveyed at different power levels, e.g., different voltage levels along bus 14. For example, communication signals, e.g., signals from firing control system 12 intended only as a query to the initiators for readiness, response signals from the initiators to firing control system 12 indicating their readiness to be armed, and fire initiation signals from firing control system 12 to the initiators may occur at a low power level, preferably lower than the no-fire threshold of the initiators. In this way, test and programming signals that are not intended themselves to arm and/or initiate the initiators are carried out at a level that is insufficient to arm and/or initiate the initiators even if the communication signals are somehow misinterpreted. Such communication signals may be carried on bus 14 at, e.g., about 7 volts. When the system is ready for arming, the energy for arming the initiators may be provided at a higher level than the communication signal level, e.g., at 28 volts.

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(Boucher at col. 10, line 58 to col. 11, line 10). As this passage makes clear, Boucher does not teach a system in which a pyrotechnic device is first armed (i.e., stores activation energy) in response to a digital arming signal and thereafter only fired (i.e., "releasing the stored activation energy into the initiator of its associated pyrotechnic device") "if both (1) the analog condition of the network has been modified to the firing condition and (2) the digital firing command includes the unique identifier of the logic device." Rather, Boucher specifically teaches the use of a higher voltage to arm the initiators. In view of the above, claims 33 and 34 are believed to be patentable over Boucher. Claims 66 and 67 recite similar features and are therefore also believed to be patentable over Boucher.

Claims 66 and 67 are similarly patentable over Boucher for the reasons discussed above. In particular, claims 66 and 67 recite "a bus controller connected to said plurality of pyrotechnic devices through said network, said bus controller being operative to (1) transmit a digital arming command onto the network, the digital arming command using one or more of the unique identifiers (2) alter an analog condition of the network to a firing condition; and (3) transmit a digital firing command onto the network, the digital firing command using one or more of the unique identifiers." These claims also recite a logic device "storing activation energy in the associated pyrotechnic device if the digital arming command includes the unique identifier of the logic device; and releasing the stored activation energy into the initiator of its associated pyrotechnic device if both (1) the analog condition of the network has been modified to the firing condition and (2) the digital firing command includes the unique identifier of the logic device," which is not disclosed or suggested in Boucher.

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Claims 33, 34, 66 and 67 are similarly patentable over Lerche. Like Boucher, Lerche teaches the use of a higher voltage for activation power. Lerche does not teach a system in which pyrotechnic devices can be placed in an armed (charged) state in response to a digital arming signal and thereafter fired if both (1) the analog condition of the network has been modified to the firing condition and (2) the digital firing command includes the unique identifier of the logic device." Rather, in Lerche an activation tool issues low current signals to selectively close activation switches in activation devices in a tool string positioned in a well. (Lerche at col. 5, lines 28-65). Once the activation is complete, the activation tool checks for confirmation from a given tool before supplying activation power to a particular device:

To activate a particular tool downhole, the user would issue a command to the surface system. When the tool activation program receives this user command (at 412), it transmits an activate command or series of commands (which includes an address of the selected control unit) down to the tool string (at 414). At this point, because of the initialization process, all the cable switches 306 in all the control units are closed. Thus, each of the microcontrollers 304 is able to receive and decode the activate command. However, only the microcontroller 304 with a matching address will respond to the activate command. When the surface system program receives a confirmation from the selected device downhole (at 416), it checks the information transmitted with the confirmation to verify that the proper device has been selected. If so, the surface system program enables the supplying of activation power to the selected device (at 418). The tool activation program then waits for the next activation command.

(Lerche at col. 6, lines 14-32). Thus, Lerche does not disclose or suggest a system in which selected pyrotechnic devices can safely be placed in an armed (charged) state in response to a digital arming signal and thereafter fired only if both (1) the analog

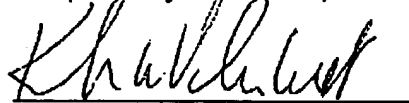
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condition of the network has been modified to the firing condition and (2) the digital firing command includes the unique identifier of the logic device." In view of the above, claims 33, 34, 66 and 67 are patentable over Lerche.

VII. Conclusion

The Applicants respectfully request reconsideration of the claim rejections. No fee is believed to be due in connection with this submission. While no fee is believed due, the Commissioner is authorized to charge any fees due in connection with this submission to Deposit Account No. 13-0017.

Respectfully submitted,



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